ZAVADOVSKIY, A.M., kand. tekhn. nauk

Reciprocal effect of turbine stages on the aerodynamic characteristics [with summary in English]. Teploenergetika 5 no. 8:8-13 Ag '58. (MIRA 11:8)

1. TSentral'nyy kotloturbinnyy institut.
(Steam turbines)

SOV/96-58-8-2/22

AUTHOR: Zavadovskiy, A.M., Candidate of Technical Science

TITLE: The Mutual Influence of Turbine Stages on the Aerodynamic Characteristics (Vzaimnoye vliyaniye turbinnykh stupeney na aerodinamicheskiye kharakteristiki)

PERIODICAL: Teploenergetika, 1958, Nr 8, pp 8-13 (USSR)

ABSTRACT: A good deal of experimental work has been done on single turbine stages but interaction between stages has been studied less. In order to find out whether the aerodynamic characteristics of individual stages can be applied when stages work in a group, the Central Boiler Turbine Institute carried out the work on experimental turbines that is described in this article. The tests were made on two groups of stages; in the first the ratio of mean diameter to length was 8.8 - 10, and in the second 3.5 - 6.3. In both cases the blades were twisted. The first set-up consisted of three stages, as shown in Fig 1a. Throughout the investigations the outlet edges of the guide vanes were directed along the radius. The axial distance between stages was 20 mm. Arrangements were made to measure the total and static pressure drops and the direction of flow at different places, so as to be able to evaluate

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the structure of the flow. It was found that, under the test conditions used, later stages have practically no influence on earlier ones and, therefore, tests on the second type of blading were made in a two-stage turbine, a diagram of the flow path of which is given in Fig 1b. The characteristics that were investigated are described, and the criteria of similarity are given. In testing groups of stages, measurements were made of the total power, the power on the wheel rims and the isotropic heat-drop corresponding to the static parameters of the working medium at inlet to and outlet from the stages. An equation is given for the heat-drop corresponding to the power of the second stage when two stages are used; a further expression is given for the efficiency of the second stage of a group. In most respects, the procedure and measurements were as described in earlier work (Teploenergetika Nr 10, 1955).
In the first series of tests the characteristics of each of the three stages were first individually studied, then in groups of two and finally all three together. The main test results are given. The changes in the degree

of reaction at different positions on the blades for a two-stage turbine are plotted in Fig 2. The experimental points on the curves show that the reactions remain practically unaltered whether the stages work separately or together. Graphs of pressure-change on the stage radius appear in Figs 3 and 4, and these too do not depend on whether the stages work singly or together. This also applies to outlet angles of the flow, as will be seen from Fig 5. Thus, with a well-designed flow path, operating near optimum conditions, preceding and succeeding stages make no difference. Curves of change in the total pressure and the outlet angles of flow are given in Fig 6 over the height of stage 2 with various gaps between stage 2 and stage 1. Power losses arise because of leakage through the gaps, as is well shown by Fig 7, which relates the influence of gap length to the change in total pressure over the height of the blades. Impaired flow structure reduces the utilisation of kinetic energy in the stage. Data on the flow of working medium is shown in Figs 8 and 9, for various values of radial gap. The flow is much the same whether the stage works individually or in a group. The following practical conclusions are drawn from the work. The aerodynamic characteristics of single stages, as obtained in experimental turbines, can be used when these stages are intermediate ones. The efficiency of the multi-stage flow path depends on the conditions of transition of flow from stage to stage. High leakages past the gaps of the preceding stage impair the flow structure and increase power losses.

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The Mutual Influence of Turbine Stages on the Aerodynamic Characteristics

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This deterioration increases with the length of the radial gap in the preceding stage; hence those leakages past the gaps are more important in multi-stage than in single-stage turbines.

There are 9 figures, 2 Soviet references.

ASSOCIATION: Tsentral'nyy kotloturbinnyy institut (Central Boiler Turbine Institute)

1. Turbines--Aerodynamic characteristics 2. Turbines--Pressure distribution 3. Turbines--Test methods 4. Turbines--Power

ZAVADOVSKIY, A.M., kand.tekhn.nauk.

Effect of gaps in the joints of segments of rims of runner wheels on the characteristics of turbine stages. Energomashinostroenie 3 no.8:26-27 Ag '57. (MIRA 10:10)

(Turbines)

ZAVADOVSKIY, A.M., kandidat tekhnicheskikh nauk; BABENKO, Kh.L., inzhener.

Some condiderations concerning S.V. Grishchuk's article.
Energomashinostroenie 3 no.9:48 S '57. (MIRA 10:10)
(Gas turbines)

ZAVADOVSKIY, A.M.

ZAVADOVSKIY, A.M., kandidat tekhnicheskikh nauk.

Profile and tip energy losses in a turbine stage [with summary in English]. Teploenergetika 4 no.8:15-18 Ag '57. (MIRA 10:9)

1. TSentral'nyy kotloturbinnyy institut.
(Turbines)

ZAVADOVSKIY, A.M.

BABENKO, Kh.L., inzh.; ZAVADOVSKIY, A.M., kand.tekhn.nauk.

Measures for increasing economic operation of steam turbines.
Elek.sta. 28 no.9:3-6 S '57 (MIRA 10:11)
(Steam turbines)

96-1-7/31

AUTHORS: Zavadovskiy, A.M., Candidate of Technical Sciences and Babenko, Kh.L., Engineer.

TITLE: The Influence of Leakage on the Operation of a Turbine Stage (Vliyaniye protechek na rabotu turbinnoy stupeni)

PERIODICAL: Teploenergetika, 1958, Vol.5, No.1, pp. 28 - 31 (USSR)

ABSTRACT: In turbine stages of the type illustrated in Fig. 1, there is an axial gap between the end surface of the diaphragm and the roots of the working blades. The flow through the blading thus has a leakage path into the space surrounding the bucket-wheel. If there are equalising aperatures in the bucket-wheel, the working medium in the stage can flow both through the gap and through the apertures. Tests made with an unbladed disc, later confirmed by tests on an experimental turbine, showed that leakage through the peripheral annular gap between the root zone and the diaphragm results from the pumping effect of the rotating disc.
Leakage influences the main flow. Gas leaking back from the bucket-wheel space into the flow part alters its direction of motion and is accelerated mainly at the expense of the energy of the main flow. The influence of this kind of leakage would be expected to decrease with increase in the degree of reaction of the stage. Gas leaking from the flow path into the bucket-

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wheel space causes hardly any distortion of the flow structure, and moderate leakage scarcely impairs the stage efficiency. Tests were made at the Central Boiler Turbine Institute (TsKTI) to investigate the operation of a stage with the two kinds of leakage. The blading used was that described in a previous article in Teploenergetika, 1957, No.6. The gaps considered are those indicated in Fig. 1. The tests were first made on a bucket-wheel without equalising holes and later on a wheel with five equalising holes initially of 15 mm diameter and later of 25 and 35 mm diameter. Graphs of the stage efficiency for various amounts of leakage into the flow path from the space are given in Fig.2. Similar curves for stages with different degrees of reaction are given in Figs. 3 and 4. This kind of leakage affects the stage efficiency differently, depending on the clearance in the blade zone. This is seen in Fig.5, which graphs stage efficiency as a function of leakage for various clearances.

The small influence of leakage into the bucket-wheel space from the flow path is confirmed by the additional data graphed in Fig.6, which was obtained for different gap sizes and degrees of reaction. The curve given in Fig. 9 shows that the steam-handling capacity of the stage is little affected by leakage.

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The Influence of Leakage on the Operation of a Turbine Stage. 96-1-7/31

There are 9 figures and 2 Slavic references.

ASSOCIATION: TsKTI

AVAILABLE: Library of Congress.

Card 3/3

GUKASOVA, Yekaterina Aleksandrovna; ZHUKOVSKIY, Mikhail Isaakovich; ZAVADOVSKIY, Anatoliy Mikhaylovich; ZYSINA-MOLOZHEN, Larisa Mikhaylovna; SKHAR', Nikolay Akimovich; TYRYSHKIN, Vsevolod Georgiyevich; ZHUKOVSKIY, V.S., prof., doktor tekhn.nauk, red.; KUTATELADZE, S.S., prof., doktor tekhn.nauk, red.; ZHITNIKOVA, O.S., tekhn.red.

[Aerodynamic improvement of bladed apparatus of steam and gas turbines] Aerodinamicheskoe sovershenstvovanie lopatochnykh apparatov parovykh i gazovykh turbin. Pod red. V.S.Zhukovskogo i S.S.Kutateladze. Moskva, Gos.energ.izd-vo, 1960. 340 p. (MIRA 13:7)

(Steam turbines) (Gas turbines)

CA

PROCESSES AND PROPERTIES INDEX

11 H

The specificity of the action of thyroxine on the feathering of birds. B. Zavadovskii and L. Lipchina. *Zhur. expil. Biol. Med.* 13, 58-62(1929).—Addn. of meat to the usual seed diet inhibits the new growth of feathers plucked before the expt. This, however, does not influence any of the specific symptoms of the thyroid hormone, such as increased growth rate, depigmentation of the wings or the alteration of the color of the neck feathers in the hen. This is offered as evidence that meat feeding has nothing in common with the thyroxine effect. Wetting with alc. of the plucked area does not bring on in chickens the depigmentation effect of the thyroid. S. Morgulis

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

BC

A 1

Influence of the anterior pituitary hormone on the genital system of male mammals. B. ZAVADOVSKI, M. G. GRIGOREVA, and V. SAKAFANOV (J. Physiol. U.S.S.R., 1933, 15, 518—633).—A method based on the measurement of the seminal vesicles is proposed for the standardisation of the anterior pituitary hormone and applied to the diagnosis of pregnancy. A. L.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

CA

11 P

The action of synthetic androsterone and testosterone on the growth of the combs of young roosters. B. M. Zavadovskii and E. G. Nesmeyanova-Zavadovskaya. *Bull. biol. med. exptl. U. R. S. S.* 3, 27-8(1937).—Androsterone in daily doses of more than 0.1 mg. increased the growth of the combs of 40-60-day-old roosters. This growth effect, however, rapidly disappeared and after 4-6 days androsterone was ineffective. Testosterone was without effect even when 1 mg. was administered daily. It is assumed that testosterone and androsterone are without effect or have only slight effect on young roosters under a definite age. **The physiological effectiveness and the standardization of the male generative-gland hormones.** *Ibid.* 29-30.—The "capon-comb units" defined by Butenandt and Ruzicka for testosterone and androsterone were confirmed. Observation of the behavior of capons after increased hormone doses showed that in addn. to the quant. difference in the action of androsterone and testosterone there also existed a qual. difference. Androsterone regulates, in the first place, the development of the secondary sexual characteristics while the action of testosterone is directed more at the sexual behavior of the animal. When androsterone was administered immediately after castration, even with a dose as small as 25γ a 20% increase in comb growth was obtained. It was also shown that normal pullets can be used for the quant. estn. of male generative gland hormones. Through *Chem. Zentr.* 1938, I, 3936 and 3937. M. G. Moore

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND CRIERS

PROCESSES AND PROPERTIES INDEX

Ca

11F

Chickens as test objects for early diagnosis of preg-
nancy in mares. B. M. Zavadovskii and E. G. Nes-
meyanova-Zavadovskaya. Bull. biol. med. exptl. U. R.
S. S. 3, 116-18(1937).—Injections of blood serum of preg-
nant mares into hens or cocks 30-80 days old and weighing
200-600 g. produced an increase in the comb size even on
the second day after the injection. This reaction has been
used as a pregnancy test. In rare cases the comb of the
chickens did not react to the gonadotropic substance. In
these cases a final diagnosis was made on the 6th day after
the beginning of the injections when the genital system
became markedly more mature than that of the controls.
S. A. Corson

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Antagonistic effect of androsterone on hyperthyroid molting of hens. B. M. Zavadovskii and E. G. Nesmeyanova-Zavadovskaya. *Bul. biol. med. exptl. U. R. S. S.* 3, 119-20(1937).—A single feeding of dry thyroid gland (10-20 g.) leads to marked and lasting (up to 7 days) molting in hens and castrated roosters but produces very little or no change in the plumage of normal roosters. Injection of male sex hormones into castrated roosters restores their normal resistance to hyperthyroid molting. Injections of synthetic androsterone simultaneously with thyroid feeding to normal hens prevented or markedly decreased molting. The quantity of androsterone injected did not influence the degree of molting but significantly affected the time of onset of molting, the larger doses producing a longer delay. Thyroid feeding did not inhibit the effect of androsterone on comb growth. S. A. C.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

11 F

The influence of prolan on the sexual activity of mares. B. M. Zavadovskii and M. B. Goldberg. *Bull. biol. méd. exptl. U. R. S. S.* 3, 357-9(1937); *Chem. Zentr.* 1938, II, 3411.—Previously sterile mares were treated with relatively small doses of prolan (600-1000 mouse units was divided into 3 doses administered on the first 3 days of estrum). In 50-60% of cases pregnancy followed. Nymphomania should be treated with larger doses (2400-7000 mouse units). After repeated matings, some of the treated animals became pregnant at once, some the following year. No control expts. in order to det. the percentage of spontaneous recovery from the condition are reported.

M. G. Moore

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

The effect of hormones of the sterin group on the oviduct of the pullet. B. M. Zavadovskii, E. G. Nesmeyanova-Zavadovskaya and B. P. Rozen. *Bull. biol. med. exptl. U. R. S. S.* 3, 640-9(1937); *Chem. Zentr.* 1938, II, 3104; cf. *C. A.* 32, 7092[1].—In expts. on hens the injection of oil solns. of folliculin, folliculin benzoate, androsterone, testosterone or lutesterone produced hypertrophy of the oviduct and growth of the comb. The serum of pregnant mares had a still more pronounced effect than these hormones. Since the different substances of the sterin group produced very similar effects, a common transformation in the ovaries of the animals does not appear to be out of the question.

M. G. Moore

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

ZAVADOVSKIY, B.M.

TUSHNOV, Mikhail Pavlovich, 1879-1935.

(The problem of spermatoxin and lysates; collection) Pod red. B.M. Zavadovskogo i K. R. Viktorova. Moskva, Sel'-khozgiz, 1938. 414 p.

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

CA

The antagonistic effect of androsterone on hyperthyroid moult in chicks. B. M. Zavadovskii and E. O. Nesmeyanova-Zavadovskaya. *J. Physiol.* (U. S. S. R.) 24, 152-61 (in English, 161) (1938).—The injection of 0.2-0.8 mg. per day of androsterone (I) into normal young hens along with the ingestion of a dried thyroid gland prepn. (II) results in an inhibition of the hyperthyroid moulting reaction. I does not inhibit the effect of II on the combs of normal hens.

S. A. Kariala

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

11 F

aa

The effect of sex hormones on the quantity of erythrocytes and hemoglobin in the blood of fowl. B. M. Zavadovskii and E. P. Rozen (K. A. Timiryazev Biol. Museum, Moscow). *Byull. Eksptl. Biol. Med.* 13, No. 3/4, 30-30 (1942). Sexual dimorphism is seen in the number of erythrocytes in fowl blood, normal cocks having 37% more than capons or pullets. To det. the nature of this, young cocks, pullets, and adult birds were injected with sex hormones. Injection of folliculin resulted in great variation in blood counts of different birds or the same bird at different times, without regularity. Injection of androsterone or testosterone in pullets led to marked uniform increase in erythrocytes and hemoglobin, to the level of that in normal cocks; with young capons there was a temporary increase in these effects without lasting effect as in pullets. Injection of gonadostimulatory stallion serum or human placental blood had no effect on adult fowl, but markedly increased erythrocytes and hemoglobin in the blood of pullets or cockerels. The latter showed premature development of seminal vesicles, combs, and sperm. The effects on erythrocytes and hemoglobin are regarded as indirect, acting through influence on the sex glands, and not directly on the blood.

K. Starr Chester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

ZAVODOVSKIY, O. M. A4

Vitamin content of fodder in relation to reproductive function and content of pregnancy hormones in horses' blood. B. M. Zavadovski and K. D. Neznajkova-Zavadovskaja. (Compt. rend. Acad. Sci. U.R.S.S., 1945, 48, 237—239).—The low rate of pregnancy among covered mares in a stud farm in the Omsk region, and deficiency of serum-gonadotrophin in pregnant mares and its continued presence after resorption of the foetus, are [illegible] and attributed to a deficiency of vitamins A and E in the fodder of the region. P. C. W.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

BC ZAVODOVSKIY, B.M. A-4

Increased fertility in swine induced by the gonad-stimulating hormones of pregnant-mare serum. B. M. Zavadovski (Compt. rend. Acad. Sci. U.R.S.S., 1945, 47, 225—228).—30 young sows treated with group I pregnant-mare serum were identical in wt. and general health with those from 20 controls but differed from them in producing an average of one more live piglet per farrow. Data obtained confirm the theory that for optimum effects the pregnant-mare serum should contain a definite ratio of two gonad-stimulating substances, viz., factor A, the follicle-stimulating substance, and factor B, which stimulates the ovulation of mature follicles and the formation of corpora lutea. Pregnant-mare serum-II contains the optimum ratio of factors for inducing oestrus and serum-I the optimum for stimulating the generative functions of the ovary. A. G. P.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

ZAVADOVSKIY, Boris Mikhaylovich; BOBYLEV, P.G., redaktor; VESKOVA, Ye.I., tekhnicheskiy redaktor.

[Animal and plant; brief introduction to the science of life] Zhivotnoe i rastenie; malen'koe vvedenie v nauku o zhizni. Izd. 2-oe, dop. i perer. E.G.Nesmeianovoi-Zavadovskoi. Moskva, Gos. izd-vo sel'khoz.lit-ry, 1956. 69 p. (MLRA 9:5)

1.Deystvitel'nyy-chlen Vsesoyuznoy akademii sel'skokhozyaystvennykh nauk imeni V.I.Lenina (for Zavadovskiy).
(Biology)

ZAVADOVSKIY, B.M., akademik; SKVORTSOV, I.M., red.

[The origin of domestic animals] Proiskhozhdenie domashnikh zhivotnykh. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1945. 54 p. (MIRA 13:1)

(Domestic animals) (Evolution)

ZAVADSKIY, B., inzh.

Speeding up the motor-bus transportation. Zhil.-kom.khoz. 9 no.6:29 '59. (MIRA 12:10)
(United States--Traffic regulations)

ZAVADOVSKIY, Boris Mikhaylovich; NESMEYANOVA-ZAVADOVSKAYA, Ye.G.; BOBYLEV, P.G., redaktor; ZUBRILINA, Z.P., tekhnicheskiy redaktor

[Origin of domestic animals] Proiskhozhdenie domashnikh zhivotnykh. Izd. 4-oe, dop. i perer. E.G. Nesmeianovoi-Zavadovskoi. Moskva, Gos. izd-vo sel'khoz. lit-ry, 1956. 111 p. (MIRA 10:4)
(Paleontology) (Domestic animals)

ZAVADOVSKIY, D. K.

Zavadovskiy, D. K. "X-ray examination of the diaphragm following an operation of diaphragmoorurotomy", Sbornik trudov, posvyashch. prof. Savinykh, Tomsk, 1948, p. 234-39.

So: U-3261, 10 April 1953 (Letopis 'Zhurnal 'nykh Statey, No. 12, 1949).

ZAVADOVSKIY, D. K.

Zavadovskiy, D. K. -- "X-ray observations on stomach patients after balneological treatment in Shira spa," Sbornik trudov (Tomskiy obl. nauch.-issled. in-t fiz. metodov lecheniya i kurortologii), Vol. VI, 1949, p. 83-88

SO: u-5241, 17 December 1953, (Letopis 'zhurnal Statey, No. 26, 1949).

ZAVADOVSKIY, D.K.

Some problems in dosimetry of betatron radiation. Med.rad. no.5:87-89 '61. (MIRA 14:11)

1. Iz kafedry rentgeno-radiologii i kafedry akusherstva i ginekologii Tomskogo meditsinskogo instituta.
(RADIATION--DOSAGE) (BETA RAYS--THERAPEUTIC USE)

ZAVADOVSKIY, D.K.

On the critical remarks on my article, "Some problems in dosimetry of betatron radiations." Med.rad. 7 no.7:78-81 Jl '62.

(MIRA 15:11)

(RADIATION—DOSAGE)

ACC NR: AP7005336 SOURCE CODE: UR/0181/67/009/001/0139/0144

AUTHOR: Zavadskiy, E. A.; Fakidov, I. G.

ORG: Institute of Physics of Metals, AN SSSR, Sverdlovsk (Institut fiziki metallov AN SSSR)

TITLE: Magnetic properties of the alloy FeRh in strong magnetic fields

SOURCE: Fizika tverdogo tela, v. 9, no. 1, 1967, 139-144

TOPIC TAGS: iron base alloy, rhodium containing alloy, saturation magnetization, temperature dependence, critical point, antiferromagnetism, phase transition

ABSTRACT: In view of discrepancies between the results of other investigators, the authors measured in detail the magnetization of FeRh over a wide range of magnetic fields and temperatures. The iron was alloyed with 53 at.% of rhodium in a high-frequency furnace and in an inert atmosphere. The measurements were made on solid samples by an induction method and on powders by means of a pulsed magnetic balance. The two measurement procedures were described by the authors earlier (FMM v. 12, 832, 1961 and v. 21, 693, 1966). The measurements were made at temperatures 77 - 400K and in magnetic fields up to 330 kOe. The results showed that saturation set in at temperatures above the critical value at which the FeRh goes over from the antiferromagnetic into the ferromagnetic state. The dependence of the critical field on the temperature is a straight line with constant slope in the entire range of temperatures and magnetic fields. Temperature hysteresis of the electric resistivity and of the

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ACC NR: AP7005336

magnetization were clearly observed in the tests at the transition from the antiferromagnetic into the ferromagnetic state. It is pointed out that this linear dependence changes if a change takes place in the magnetic structure at some value of the magnetic field, causing the slope of the line to change. The authors thank A. Ya. Afanas'yev for preparing the alloy and I. I. Kuntsevich for help with the measurements. Orig. art. has: 6 figures and 4 formulas.

SUB CODE: 20/ SUBM DATE: 03Jun66/ ORIG REF: 004/ OTH REF: 009

Card 2/2

BA A.III - 18

Effect of carotene, vitamin C, and nicotinic acid on development of D-hypervitaminosis. N. N. Matsko and E. V. Zaradetsky (J. Physiol., USSR, 1951, 37, 233—239).—Rats placed on a diet containing excess amounts of irradiated ergosterol developed signs of D-hypervitaminosis. This could be prevented or cured by administration of carotene but not by ascorbic or nicotinic acid.

D. H. Smyth.

ZAVADOVSKAYA, Ye.K.; IVANKINA, M.S.; MELIK-GAYKAZYAN, I.Ya.

Pore formation during annealing of mixed KCl-KBr crystals. Kristallografiia 5 no.2:324-325 Mr-Ap '60. (MIRA 13:9)

1. Tomskiy politekhnicheskiy institut.
(Potassium chloride) (Potassium bromide)

ZAVADSKAYA, I.G.; FEL'DMAN, N.L.; KAMENTSEVA, I.Ye.

Carbohydrate content and cold resistance in the cells of higher plants. Dokl. AN SSSR 157 no.4:995-997 Ag '64 (MIRA 17:8)

1. Botanicheskiy institut im. V.L. Komarova AN SSSR i Institut tsitologii AN SSSR. Predstavleno akademikon N.M. Sisakyanom.

ZAVADSKAYA, I.O.

Effect of unfavorable soil moisture conditions on the protoplasm of the epidermis cells in "Viner" barley leaves. Uch. zap. Ped. inst. Gerts. 178:181-183 '59. (MIRA 14:7)
(Barley) (Plants, Effect of soil moisture on) (Protoplasm)

SKAZKIN, F.D.; ZAVADSKAYA, I.G.

Microsporogenesis in barley as affected by inadequate soil moisture and nitrogen nutrition. Dokl. AN SSSR 117 no.1:150-152 N-D '57. (MIRA 11:3)

1. Leningradskiy gosudarstvennyy pedagogicheskiy institut im. A.I.Gertsena. Predstavleno akademikom A.L.Kursanovym.
(Barley) (Spores (Botany))

ZAVADSKAYA, I.G., Cand Biol Sci -- (diss) "Effect of nitrogen w/o- on certain physiological processes and the formation of in barley pollen ~~when there is insufficient~~ under inadequate supply ~~of~~ water ~~to~~ of the soil ~~in~~ during various periods of its development." Len, 1959, 19 pp (Min of Education RSFSR. Len State Pedagogical Inst im A.I. Gertsen) 150 copies (KL, 35-59, 113)

GOL'TSMAN, Lyubov' Naumovna; kand.ekonom.nauk; ZAVADSKAYA, Irina Yevseyevna, kand.ekonom.nauk; ORLOVA, Raisa Il'inichna, nauchnyy sotrudnik; YAMPOL'SKAYA, Tat'yana Georgiyevna, kand.tekhn.nauk; KHOLMOGOROVA, T.A., red.izd-va; SHLIKHT, A.A., tekhn.red.

[Maintaining city streets] Voprosy ekspluatatsii gorodskikh dorog. Moskva, Izd-vo M-va kommun.khoz.RSFSR, 1959. 88 p. (MIRA 12:11)

(Streets--Maintenance and repair)

ZAVADSKAYA, M. S.

"Trachoma in Belorussia and Means of Eradicating It." Cand Med Sci, Minsk State Medical Inst, 2 Dec 54. (SB, 18 Nov 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)

SO: Sum. No. 521, 2 Jun 55

ZAVADSKAYA, T. I. PA 31/49T34

USSR/Medicine - Undulant Fever Nov 48
Medicine - Vaccine Therapy

"The Problem of Using Vaccine for Treating Brucellosis," T. I. Zavadskaya, Hosp Therapeutics Clinic, Rostov Med Inst, 7¼ pp

"Klin Med" Vol XXVI, No 11

Data is based on 60 cases. Concludes that vaccine cannot be regarded as specific remedy for brucellosis. It does, however, lower temperature and decrease pain.

[redacted] 31/49T34

ZAVADSKAYA, T.I., dotsent; DOMBROVSKAYA, Ye.A.

Clinical aspects and pathomorphology of acute tuberculous sepsis. Sov. med. 27 no.2:9-14 F '64. (MIRA 17:10)

1. Kafedra gospital'noy terapii (zav. - prof. N.M.Ivanov) i kafedra patologicheskoy anatomii (zav. - prof. I.I. Dorokhov) Rostovskogo-na-Donu meditsinskogo instituta.

ZAVADSKAYA, T.I., kand.med.nauk

The problem of treatment of diabetic coma. Sov.med. 22 no.6:107-109 Je '58
(MIRA 11:9)

1. Iz kafedry gospital'noy terapii (zav. - prof. N.M. Ivanov) Rostovskogo meditsinskogo instituta.
(DIABETES MELLITUS, compl.
coma, ther. (Rus))

ZAVADSKAYA, T.I. (Rostov-na-Donu); VORONOV, A.S., professor, zaveduyushchiy.

Clinical aspects of thrombosis of the splenic vein. Klin.med. 31 no.7:52-56 Jl '53. (MLRA 6:9)

1. Kafedra gospital'noy terapii Rostovskogo meditsinskogo instituta.
(Thrombosis) (Veins--Diseases)

ZAVADSKAYA, T.I., kandidat meditsinskikh nauk (Rostov-na-Donu)

Two cases of cutaneous xanthomatosis. Klin.med. 34 no.4:57-59 Ap '56.
(MIRA 10:1)

1. Iz kafedry gospital'noy terapii (zav. - prof. A.S.Voronov) Rostovskogo meditsinskogo instituta.
(LIPOIODOSIS,
cuteneous, case reports (Rus))
(SKIN, diseases,
xanthomatosis, case reports (Rus))

ZAVADSKAYA, T. N.

USSR/Geophysics - Physics of the Earth

FD-1720

Card 1/1 : Pub. 45-8/12

Authors : Berdichevskiy, M. N., and Zavadskaya, T. N.

Title : On the formation of an electric field in the earth

Periodical : Izv. AN SSSR, Ser. geofiz., 178-180, Mar-Apr 1955

Abstract : When a constant current is introduced into a circuit consisting of connecting wires, electrodes and the earth, transitional processes take place in the earth resulting in the formation of an electromagnetic field. Having examined the records obtained at a low level of interference from the field of telluric currents, the authors present diagrams in which are depicted eight basic forms of the formation of the elastic field. The diagrams show impulse, calibrating impulse and current impulse.

Institution : Scientific Research Institute of Geophysical Methods of Prospecting, Ministry of Petroleum Industry

Submitted : November 23, 1953

ZAVADSKAYA, T.N.

On transformation of sounding curves. Prikl. geofiz. no.19:47-56 '58. (MIRA 11:4)

(Prospecting--Geophysical methods)

ZAVADSKAYA, T.N.

Results of testing the method of average apparent resistance. Razved. geofiz. no.4:52-58 '65. (MIRA 18:9)

CHERNOMORDIK, A.B.; BASS, T.M.; BASS, M.A.; KOVALENKO, F.N.; ZAVADSKAYA, TS.Ye.

Neomycin-resistant forms of colienterites in children and their treatment. Antibiotiki 10 no.9:859-861 S '65. (MIRA 18:9)

1. Otdel antibiotikov Kiyevskogo instituta epidemiologii i mikrobiologii.

LAMKINA, V.Yu.; NEMCHINOV, G.A.; ZAVADSKAYA, V.A.

Use of pituitrin in cases of difficult egg-laying. Ptitse-vodstvo 8 no.8:45 Ag '58. (MIRA 11:10)

1. Kafedra akusherstva i ginekologii Buryat-Mongol'skogo zoovet-instituta.

(Eggs--Production) (Pituitrin)

ZAVADSKIY, A.M.

Craspedacusta marginata (Modeer) polyps in Tashkent. Dokl. AN SSSR 60 no.5:921-923 My '48. (MLRA 10:8)

1. Predstavleno akademikom L.S. Bergom.
(Coelenterata)

ZAVADSKIY, A. M.

PA 68T84

USSR/Medicine - Marine Organisms May 1948
Medicine - Taxonomy

"Craspedacusta Marginata (Modeer) Polyps in Tashkent," A. M. Zavadskiy, 3 pp

"Dok Ak Nauk SSSR" Vol LX, No 5

Subject polyp is only form of hydrozoa possessing metagenesis. Describes characteristics of rare polyps found by author in an aquarium in 1941. Gives state of polyps in aquarium and methods employed to study them. Submitted by Academician L. S. Berg 12 Mar 1948.

FDB 68T84

ZAVADSKIY, B., inzhener.

Gyrobus. Zhil.-kom.khoz. 5 no.8:27 '55. (MLRA 9:3)
(Switzerland--Motorbuses)

ZAVADSKIY, B., inzh.

Antiskid chains. Avt.transp. 38 no.1:58-60 Ja '60.
(MIRA 13:5)
(Automobiles--Apparatus and supplies)

ZAVADSKIY, B.

Diagnosis, Radioscopic

Use of X-rays in medicine and the role of the nurse in roentgenological examination of patients. Med. sestra, No. 4, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

ZAVADSKIY, B.

NURSES AND NURSING

Use of X-rays in medicine and the role of the nurse in roentgenological examination of patients. Med. sestra no. 4, 1952.

Monthly List of Russian Accessions, Library of Congress. November, 1952. Unclassified.

ZAVADSKIY, B.F.

GAVRILOV, A.N., doktor tekhnicheskikh nauk, redaktor; POLIAKOV, K.A., professor, retsenzent; ZAVADSKIY, B.F., inzhener, retsenzent; RUSEVICH, I.M., inzhener, redaktor; MODEL', B.I., tekhnicheskiy redaktor; TIKHONOV, A.Ya., tekhnicheskiy redaktor

[Progressive practice in instrument making] Progressivnaia tekhnologiia priborostroeniia. Moskva, Gos. nauchno tekhn. izd-vo mashinostroit. i sudostroit. lit-ry. No.2. [Perfecting instrument production techniques] Sovershenstvovanie tekhnologii proizvodstva priborov. Pod red. A.N.Gavrilova. 1953. 337 p. (MLRA 8:3)

1. Vsesoyuznoye nauchnoye inzhenerno-tekhnicheskoye obshchestvo mashinostroiteley i priborostroiteley.
(Instruments)

ZAVADSKIY, Boris Iosifovich

[Five years overseas; notes on Canada] Piat' let za okeanom; kanadskie zapiski. Moskva, Sovetskii pisatel', 1961. 349 p. (MIRA 14:8)

(Canada--Description and travel)

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001963920017-3"

ZAVADSKIY, B. I., ENG.; IL'IN, V. A., ENG.

Steam Boilers

Block mount for PK-10 boiler, Elek, sta., 23, no. 6, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952. UNCLASSIFIED.

ZAVADSKIY, F. I.; IL'IN, V. A., ENGS.

Steam Boilers - Testing

Hydraulic testing of boilers eith the help of compressed air. Elek. sta. 23 no. 8, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

ZAVADSKIY, B. I.; IL'IN, V. A., Engs.

Steam Boilers - Testing

Hydraulic testing of boilers with the help of compressed air. Elek. sta. 23 no. 8, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. Unclassified.

ZAVADSKIY, B. I., ENG.; IL'IN, V. A., ENG.

Steam Boilers

Block mount for PK-10 boiler, Elek, sta., 23, no. 6, 1952

Monthly List of Russian Accessions, Library of Congress October 1952. Unclassified.

ZAVADSKIY, B.I., inzhener; IL'IN, V.A., inzhener.

Installing a boiler on previously prepared post foundation. Elek.sta. 24 no.9:51-52 S '53. (MLRA 6:8)
(Boilers)

1. ZAVADSKIY, B.I., ENG.

2. USSR (600)

4. Steam Boilers

7. Tightening the flange connections of steam cooler of a high-pressure boiler. Elek. sta. 23 no.9, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

ZAVADSKIY, B.I.

Automobile trailer. Avtomobilist 1:124-129 '61. (MIRA 15:1)
(Automobiles--Trailers)

ZAVADSKIY, B.S.

Readers discuss "Meditsinskaia Sestra" at a readers' conference in Kolomna. Med. sestra 19 no.9:41-42 S '60. (MIRA 13:9)
(NURSES AND NURSING--PERIODICALS)

ZAVADSKIY, B.S. (Kolomna)

"School children at the health station". Med.sestra 15 no.6:29 Je '56. (MIRA 9:8)

(SCHOOL HYGIENE) (BORUTSKA, I.M.) (RED CROSS)

ZAVADSKIY, B.S.

Application of roentgen rays in medicine and role of a nurse in x-ray examination of patients. Med. sestra, Moskva no. 8:22-26 Aug 1952. (CIML 23:1)

1. Roentgen Technician. 2. Kolomna, Moscow Oblast.

ZAVADSKIY, B.S. (Kolomna)

"The road to health, strength, and long life." I.M.Sarkizov-Serazini. Reviewed by B.S.Zavadskii. Fel'd. i akush. no.10:62-63 O '55. (MLRA8:12)
(PUBLIC HEALTH) (SARKIZOV-SERAZINI, I.M.)

ZAVADSKIY, B.S. (Kolomna, Moskovskaya oblast')

Character qualifications required of a nurse. Med.sestra no.8: 18-23 Ag '55. (MLRA 8:11)

(NURSING PROFESSION
in Russia, communist moral features)
(ETHICS, MEDICAL
in Russia, communist moral features of nurse)

ZAVADSKIY, B.S., fel'dsher (Kolomna)

The nurse as promotor of health education. Med. sestra no.10:
28-30 O '54. (MLRA 7:12)
(BIOGRAPHIES
Serikova, Klaudiia Grigor'evna)

ZAVADSKIY, B. S.

ZAVADSKIY, B.S.

Brief news. Med. sestra no.8:29-30 Ag '54. (MLRA 7:8)

1. Predsedatel' soveta meditsinskikh sester.
(NURSES AND NURSING--PERIODICALS)

ZAVADSKIY, B.S. (Kolomna)

Letters to the editor. Med.sestra 18 no.10:44-45 O '59. (MIRA 13:1)

1. Predsedatel' Soveta srednikh meditsinskikh rabotnikov.
(KOLOMNA (MOSCOW PROVINCE)--MEDICAL PERSONNEL)

ZAVADSKIY, B.S.

A good tradition. Med. sestra 20 no.9:61-63 S '61. (MIRA 14:10)
(NURSES AND NURSING—PERIODICALS)

AUTHORS: Fakidov, I. G. and Zavadskiy, E. A. SOV/126-6-3-28/32

TITLE: Generation of Super-intensive Magnetic Field Pulses (Polucheniye sverkhsil'nykh impul'snykh magnitnykh poley)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 3, p 569 (USSR)

ABSTRACT: In 1929, Academician P. L. Kapitza managed to obtain magnetic surge fields with potentials of up to 3 600 000 Oe and utilised them for studying the galvanometric properties of a large number of metals and some semi-conductors. Earlier, the same author produced a field with a potential of the order of 500 000 Oe in a coil of 1 mm dia. by discharging a powerful battery (Ref 1). The interest in phenomena relating to the influence of strong magnetic fields on the physical properties of metals and semi-conductors has considerably increased since that time. Developments in theoretical physics in recent years led to the conclusion that investigation of the magnetic and galvanometric properties of solid bodies in the field of intensive and super-intensive magnetic fields can yield important information on the shape and topology of energy surfaces of conductivity

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SOV/126-6-3-28/32

Generation of Super-intensive Magnetic Field Pulses

electrons (Ref 2). In the laboratory of electric phenomena of the Institute of Metal Physics, Ural Branch, Ac.Sc. USSR a test rig is at present in operation for generating strong magnetic fields using short current pulses obtained by discharging a condenser battery of 1600 μF capacity charged to a potential of 3000 V. The discharge of the condenser battery through a coil is periodic with a frequency of 2800 to 3000 c.p.s. and a damping decrement Δ = 3 to 5.5, depending on the number of turns of the coil. This set-up permits generating inside a single-layer coil a magnetic field with a potential of over 500 000 Oe with a degree of uniformity of up to 1.5% inside a cylinder of 6.5 mm dia. and a height of 5 mm (it is mentioned in a footnote that the authors have succeeded in raising this potential up to 700 000 Oe). In Fig.1 an oscillogram is reproduced which shows the dependence on time of the potential of the magnetic field. The authors measured the dependence

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SOV/126-6-3-28/32

Generation of Super-intensive Magnetic Field Pulses

of the electric conductivity of n and p-type germanium at a high frequency (ρ = 54 Ohm·cm, ρ = 58 Ohm·cm) on the transverse magnetic field for T = 300, 77 and 20°K. It was established that $\Delta R_1/R$ of n-type germanium (ρ = 54 Ohm·cm) at T = 20°K is subjected to fluctuations. The results of these measurements and a detailed description of the set-up for measuring intensive magnetic fields will be published in later work.

Acknowledgments are made to N. V. Volkenshteyn for supplying the liquid hydrogen and to K. I. Davidenko for carrying out the measurements.

There are 1 figure and 6 references, 1 of which is Soviet, 5 English.

(Note: This is a complete translation)

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SOV/126-6-3-28/32

Generation of Super-intensive Magnetic Field Pulses

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR (Institute of Metal Physics, Ural Branch of the Ac. Sc., USSR)

SUBMITTED: January 8, 1958

1. Magnetic fields--Development 2. Magnetic fields--Applications 3. Magnetic fields--Effectiveness 4. Magnetic fields--Measurement 5. Pulses--Properties

Card 4/4

56-34-4-56/60

AUTHORS: Fakidov, I. G., Zavadskiy, E. A.

TITLE: Oscillations of the Electric Resistance of n-Type Germanium in Strong Pulse-Like Magnetic Fields (Ostsillyatsiya elektricheskogo soprotivleniya germaniya n-tipa v sil'nykh impul'snykh magnitnykh polyakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 1036 - 1037 (USSR)

ABSTRACT: The authors investigated the change of the electric resistance of 3 monocrystalline germanium samples of the n-type in a transversal pulse-like magnetic field with an intensity up to 120 000 Gauss at temperatures of 300, 77 and 20°K. The magnetic field was produced by means of the discharge of a condenser bank by a solenoid, and in the opening of that solenoid a Dewar flask containing the sample was put up. The germanium samples were of different degrees of purity. In magnetic fields of 25 000 - 120 000 Gauss and at T = 300°K $\Delta R/R_0$ depends linearly on the field intensity in the case of all 3 samples, the 3 angles of gradient of the line are given. At 77°K and in the same interval of the field intensities the linear dependence holds only for 2

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samples. In the third sample that dependence has a curved character with a tendency to saturation. The change of the $\Delta R/R_0$ of the sample number 1 (specific resistance ρ = 54 Ω cm) was also investigated at 20°K in the case of field intensities up to 110 000 Gauss. It is interesting that in such a case the resistance of the sample decreases instead of increasing as usual. But in the case of a reduction of the amplitude to zero the resistance of the sample returns to its original value. Besides this fact in the case of such germanium samples of the n-type an oscillation of the electric resistance in the interval of the electric field intensities of 25 000 - 110 000 Gauss was observed. The period of that oscillation is 0,10 Kilogauss and its maximum amplitude H = 55 000 Gauss. The author points to different previous works, dealing with the same subject. Data on details of the experiments and on the devices for the production of strong magnetic fields will be published in a later paper. There are 1 figure and 5 references, 1 of which is Soviet.

Oscillations of the Electric Resistance of n-Type Germanium in Strong Pulse-Like Magnetic Fields 56-34-4-56/60

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR (Institute of Physics of Metals, Urals Branch, AS USSR)

1. Germanium crystals--Oscillations

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SOV/126-7-4-24/26

AUTHORS: Fakidov, I.G. and Zavadskiy, E.A.

TITLE: An Induction Method of Measuring the Hall Effect in Strong Pulsed Magnetic Fields

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 4, pp 637-638 (USSR)

ABSTRACT: In the classical method of measuring the Hall effect a primary current from an external source is passed through a sample in a magnetic field. If the magnetic field is not constant, currents induced in the sample may be used instead of the primary current. A method using varying magnetic fields to measure the Hall constant was first described by Busch et al (Ref 1); they used currents induced on switching on or off of a d.c. electromagnet. The present authors describe an application of the Busch method to strong periodic pulsed magnetic fields and materials of high resistivity such as semiconductors. A sample in the form of a disc of radius r_o was placed in a coil at right-angles to magnetic force lines (Fig 1). The varying magnetic field induced currents in the disc. For samples of high-resistivity material in the form of thin discs, the surface effects and the

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SOV/126-7-4-24/26

An Induction Method of Measuring the Hall Effect in Strong Pulsed Magnetic Fields

demagnetizing action of induced currents may be neglected. Since the applied magnetic field is of damped oscillatory nature the magnetic induction is given by

$$B = B_m e^{-bt} \sin \omega t \qquad (4)$$

where $b = \delta/T$, δ is the logarithmic decrement and T is the time period. The value of the Hall emf between the centre of the disc and its periphery, at the moment of the first maximum $B_{m_1} = B_m \exp(-\delta/4)$ of the magnetic induction, is given by

$$V_{x_1} = -AR\sigma r_o^2 \omega B_{m_1}^2, \text{ where } A = \frac{1}{8} e^{\delta/4}(1 - \tan\varphi),$$

R is the Hall constant, $\tan\varphi = b/\omega$, ω is the angular frequency, σ is the electrical conductivity of the sample. The relationship obtained here was checked on a germanium disc of 11 mm diameter, 1 mm thickness in magnetic fields up to 120 kilogauss and $\omega = 16000$ sec^{-1}. The calculated values of the Hall constant R were compared with the results of measurements on a plate of

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An Induction Method of Measuring the Hall Effect in Strong Pulsed Magnetic Fields

the same material; the two sets of results agreed satisfactorily. The method can be used also for undamped alternating magnetic fields. Then $b = 0$ and $\varphi = 0$ and the Hall emf between the centre of the disc and its periphery is given by

$$V_x = -\frac{1}{8} R\sigma r_0^2 \omega B_m^2 \sin 2\omega t \qquad (9)$$

In low-frequency magnetic fields and for thin discs the relationships obtained by the authors are also valid for metals. There is 1 figure and 1 Swiss reference.

ASSOCIATION: Institut fiziki metallov AN SSSR (Metal Physics Institute, AS USSR)

SUBMITTED: December 4, 1958

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67687

24.7600 SOV/126-8-4-9/22

AUTHORS: Fakidov, I.G., and Zavadskiy, E.A.

TITLE: A Generator of Ultrahigh Pulsed Magnetic Fields

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 4, pp 562-568 (USSR)

ABSTRACT: The pulsed magnetic fields are obtained by discharging a bank of capacitors through special coils. Magnetic fields up to 700 000 oersted can be obtained in this way. A photograph of the apparatus is shown in Fig 1. Sixteen type IM-3/100 capacitors are employed so that 7200 joules can be stored at a nominal voltage of 3 kV. By reducing the resistance and the inductance of the discharge circuit it was possible to increase the percentage of energy used to produce the magnetic field to 17%. The coils can take currents up to 60 000 amp. A block diagram of the apparatus is shown in Fig 2. The bank of capacitors is charged from the high-voltage rectifier through the current limiting resistor R. The discharge takes place through the spherical discharger 3. If necessary, the circuit can be controlled automatically to produce the required current pulses. A drawing of one of the coils is given in Fig 4, and the

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A Generator of Ultrahigh Pulsed Magnetic Fields

corresponding magnetic field distribution for a coil with an internal diameter of 16 mm is shown in Fig 5. The magnetic field was measured with a search coil in conjunction with an RC integrator, and the calculated value of 700 000 oersted was confirmed experimentally. The ultrahigh pulsed magnetic fields are being used by the present authors in a study of galvanomagnetic phenomena and of the photogalvanomagnetic effect in various semiconductors. Magnetisation studies on ferrites are also being carried out. A similar apparatus has been built in the low-temperature laboratory of the Moscow State University Professor A.I. Shal'nikov, Corr. Memb. AS USSR. Acknowledgement is made to I.I. Kuntsevich and A.A. Teterin.

There are 6 figures, 2 tables and 7 references, of which 1 is French, 1 is Soviet and 5 are English.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, Ac.Sc. USSR)

SUBMITTED: February 28, 1959

Card 2/2

ZAVADSKIY, E.A.; FAKIDOV, I.G.

Electric conductivity of n-type germanium in strong magnetic fields. Fiz. met. i metalloved. 10 no.3:495-496 S '60. (MIRA 13:10)

1. Institut fiziki metallov AN SSSR.
(Germanium—Electric properties) (Magnetic fields)

ZAVADSKIY, E. A., Cand. Phys-Math. Sci. (diss) "Galvano-magnetic Properties of Germanium in Strong Impulse Magnetic Fields." Sverdlovsk, 1961, 17 pp. (Acad. of Sci. USSR, Institute of Physics of Metals) 170 copies (KL Supp 12-61, 251).

89947

S/126/61/011/001/015/019
E032/E314

9.4300 (1043, 1143, 1150)

AUTHORS: Zavadskiy, E.A. and Fakidov, I.G.

TITLE: Electrical Conductivity of n-Ge in Strong Pulsed Magnetic Fields

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol. 11, No. 1, pp. 145 - 147

TEXT: In a previous paper the authors showed that the relative change in the resistance of n-Ge reaches a saturation value in a strong longitudinal magnetic field, and beginning at a certain value of the field, commences to increase linearly. These results are in agreement with the theoretical predictions of Tsidil'kovskiy and Shirokovskiy (Ref. 2) and Gold and Roth (Ref. 3). The present work is concerned with the variation in the resistivity in a strong transverse magnetic field. n-Ge monocrystalline specimens having resistivities of 2, 30 and 46 ohm.cm at room temperature were used. The specimen dimensions were 9 x 1.5 x 0.8 mm. Current leads covering end surfaces and voltage probes 3.5 mm apart

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were used. The contacts were ohmic and the measurements were carried out as in Ref. 1. Fig. 1 shows the relative change in the resistivity for the specimen with ϱ = 2 ohm.cm at different temperatures as a function of the magnetic field (in kOe). The results refer to the case H||[111]. In this specimen the mobility of current carriers was u = 3500 cm^2/Vsec so that at H = 200 kOe uH/c $\approx$ 7.0. Saturation would be expected to set in at uH/c = 1. The quantity $(\Delta\varrho_\perp/\varrho_o)_{sat}$ for H||[111] can be calculated from the formula:

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$$\left(\frac{\Delta \rho_\perp}{\rho_o}\right)_{sat} = \frac{(2\gamma + 1)(4\gamma + 5)}{3\gamma(\gamma + 8)} - 1$$

given in Ref. 2, where $\gamma = m_\ell / m_t$ and m_ℓ and m_t are the longitudinal and transverse effective masses. Assuming that $\gamma = 17$, one finds that $(\Delta\rho_\perp/\rho_o)_{sat} = 1.0$. However, complete saturation is not observed. Continuous approach to saturation is, in fact, replaced by a linear increase. A "discontinuity" in the curve is nevertheless observed at $(\Delta\rho_\perp/\rho_o) = 1.2$, i.e. the discontinuity occurs close to the theoretical value of $(\Delta\rho_\perp/\rho_o)_{sat}$. The "discontinuity" can apparently be explained by the quantisation of the energy of the current carriers in the magnetic field which becomes appreciable for $hw > kT$ where w is the cyclotron frequency and h is the Planck constant divided by 2π. Assuming that
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the effective mass $m^* = 0.08\ m_o$, one finds that $h\omega = kT$ will occur for $H = 35$ kOe and $T = 58\ ^oK$, while at $T = 77\ ^oK$ the magnetic field should be 45 kOe. It is clear from Fig. 1 that the "discontinuity" does in fact occur at magnetic fields close to those for which $h\omega = kT$. According to Argyres (Ref. 4), the linear relation between $(\Delta\rho_\perp/\rho_o)$ and H should occur in non-degenerate semiconductors when $h\omega > kT$ and scattering on phonons terminates. For specimens having resistivities of 2 ohm.cm or greater, scattering on impurity ions can dominate only below 20 ^oK. Thus the present results are in good agreement with those reported in Ref. 4. Fig. 2 shows the plot of $(\Delta\rho_\perp/\rho_o)$ as a function of H(kOe) for the specimen with $\rho = 30$ ohm.cm. In this figure $H \parallel [110]$. A sharp transition to the linear law is found to occur at $T = 58$ and 77 ^oK when $(\Delta\rho_\perp/\rho_o) = 2.9$, which is close to the calculated value $(\Delta\rho_\perp/\rho_o) = 3.3$. The latter value

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was obtained for $\gamma = 17$ from the formula given by Gold and Roth in Ref. 3. The "discontinuity" disappears at high temperatures in weak magnetic fields (up to 18 kOe). The results obtained by the present authors at $T = 94\ ^{\circ}K$ are in good agreement with those reported by Herring et al (Ref. 5). The resistivity of some specimens was also measured at $T = 20\ ^{\circ}K$. In the case of specimens with $\rho = 30$ ohm.cm with $H \parallel [111]$, the curves of $(\Delta\rho_{\perp}/\rho_o)$ versus H exhibit the following behaviour: 1) for fields up to 15 kOe the curves approach saturation at $(\Delta\rho_{\perp}/\rho_o) = 3.0$; 2) between 35 kOe and 110 kOe the curve is linear and $(\Delta\rho_{\perp}/\rho_o)$ increases from 4 to 20; 3) above 110 kOe the curve becomes nonlinear and the values of $(\Delta\rho_{\perp}/\rho_o)$ are 25, 29.5 and 31.5 at 140, 170 and 200 kOe, respectively. The Hall effect has also been measured and the results will be reported in the next paper of the present journal.

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Electrical Conductivity of n-Ge in Strong Pulsed Magnetic Fields

There are 2 figures and 6 references: 3 Soviet and 3 non-Soviet.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals of the AS USSR)

SUBMITTED: July 20, 1960

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E032/E314

Electrical Conductivity of n-Ge in Strong Pulsed Magnetic Fields

Fig.1.

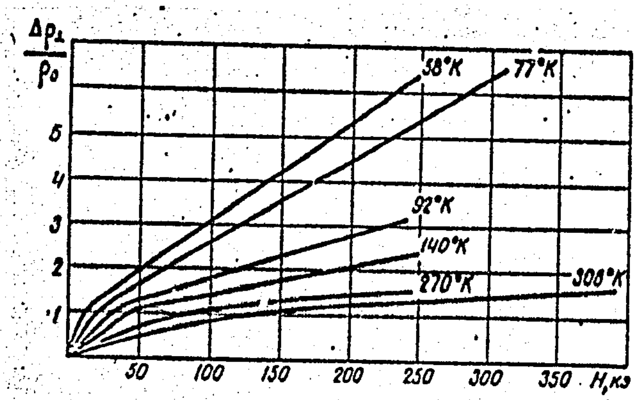

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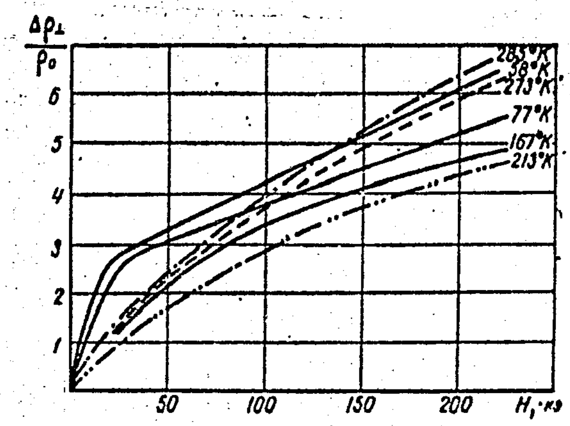
Fig.2.



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